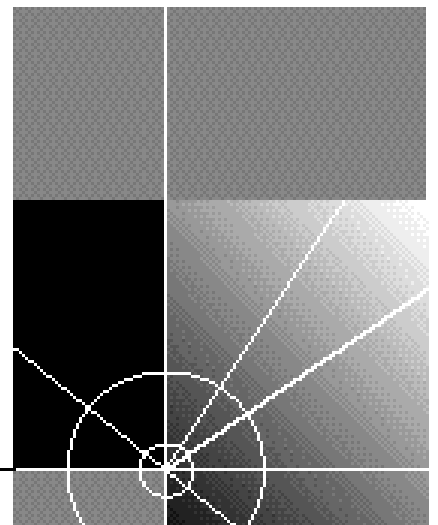




CoreBuilder™ 5000 100BASE-TX Workgroup FastModule User Guide

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ABOUT THIS GUIDE

This guide explains how to install 3Com CoreBuilder™ 5000 12-Port 100BASE-TX Workgroup FastModules, manage 100BASE-TX Workgroup FastModules using the 3Com® CoreBuilder 5000 Distributed Management Module, and monitor network traffic.



If the information in the release notes shipped with your product differs from the information in this guide, follow the release note instructions.

Audience

This guide is intended for the following people at your site:

- Network manager or administrator
- Trained hardware installer or service personnel

How to Use This Guide

the following table shows the location of specific information.

Table 1 How to Use This Guide

If you are looking for:	Turn to:
Information about 100BASE-TX Workgroup FastModule features and benefits.	Chapter 1
Information about designing and expanding the network and using module workgroups.	Chapter 2
Information about unpacking and installing the module.	Chapter 3
Information about configuring the module.	Chapter 4
Information about verifying LED and network operation.	Chapter 4
Understanding and troubleshooting using front panel LEDs.	Chapter 5
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Information about getting technical support.	Appendix B

Conventions

The following tables list conventions used throughout this guide.

Icon	Notice Type	Alerts you to...
	Information note	Important features or instructions
	Caution	Risk of personal safety, system damage, or loss of data
	Warning	Risk of severe personal injury

Convention	Description
"Enter" vs. "Type"	When the word "enter" is used in this guide, it means type something, then press the Return or Enter key. Do not press the Return or Enter key when an instruction simply says "type."
Text represented as screen display	This typeface is used to represent displays that appear on your terminal screen. For example: Enter value in Hex:
Text represented as commands	This typeface is used to represent commands that you enter. For example: show vbridge 3 aft bridge_port 6.all
<i>Italics</i>	<i>Italics</i> are used to denote <i>new terms</i> or <i>emphasis</i> .

Related Documents

This section provides information on supporting documentation, including:

- [3Com Documents](#)
- [Reference Documents](#)

3Com Documents

The following documents provide additional information on 3Com products:

CoreBuilder 5000 Integrated System Hub Installation and Operation Guide – Provides information on the installation, operation, and configuration of the CoreBuilder 5000 hub. This guide also describes the principal features of the CoreBuilder 5000 Fault-Tolerant Controller Module.

CoreBuilder 5000 Distributed Management Module User Guide – Provides information on the CoreBuilder 5000 Distributed Management Module's operation, installation, and configuration. This guide also describes the software commands associated with the distributed management module.

CoreBuilder 5000 Distributed Management Module Commands Guide – Describes each management command by providing detailed information on the command's format and use.

For a complete list of 3Com documents, contact your 3Com representative.

Reference Documents

The following documents supply related background information:

Almquist, P., *Type of Service in the Internet Protocol Suite*, RFC 1349, July 1992.

Case, J., Fedor, M., Scoffstall, M., and Davin, J., *The Simple Network Management Protocol*, RFC 1157, University of Tennessee at Knoxville, Performance Systems International and the MIT Laboratory for Computer Science, May 1990.

Kastenholz, F., *Definitions of Managed Objects for the Ethernet-Like Interface Types*, RFC 1643, FTP Software, Inc., July 1994.

Kastenholz, F. and McCloghrie, K., *Evolution of the Interfaces Group of MIB-II*, RFC 1573, FTP Software and Hughes LAN Systems, January 1994.

McMaster, D. and McCloghrie, K., *Definitions of Managed Objects for IEEE 802.3 Repeater Devices*, RFC 1516, Synoptics Communications, Inc., September 1993.

Plummer, David C., *An Ethernet Address Resolution Protocol*, RFC 826, MIT, November 1982.

Postel, J. and Reynolds, J., *Assigned Numbers*, RFC 1700, ISI, October 1994.

Rose, M. and McCloghrie, K., *Management Information Base for Network Management of TCP/IP-Based Internets: MIB-II*, RFC 1213, Performance Systems International and Hughes LAN Systems, March 1991.

Sollins, K., *The TFTP Protocol (Revision 2)*, RFC 1350, MIT, July 1992.

Waldbusser, S., *Remote Network Monitoring Management Information Base*, RFC 1757, Carnegie Mellon University, February 1995.



INTRODUCTION

This chapter describes the 3Com CoreBuilder™ 5000 12-Port 100BASE-TX Workgroup FastModule (Model Number 3C96512M-TX). This chapter contains the following sections about the 12-Port 100BASE-TX Workgroup FastModule:

- [100BASE-TX Workgroup FastModule Description](#)
- [100BASE-TX Workgroup FastModule Features](#)

100BASE-TX Workgroup FastModule Description

The CoreBuilder 5000 100BASE-TX Workgroup FastModule is a high-speed module for the 3Com® CoreBuilder 5000 Integrated System Hub.

The 100BASE-TX Workgroup FastModule provides:

- Twelve shared 100BASE-TX-compliant ports using RJ-45 shielded connectors supporting 100BASE-TX transmission over category 5 unshielded or shielded twisted-pair cabling.
Collectively, these ports form a single group that can be assigned to one of the 4 Fast Ethernet backplane channels or a single isolated channel.
- Twelve bicolored LEDs and a module status LED on the front panel. These LEDs provide status information for the module and each of the ports ([Figure 1-1](#)).

12-Port 100BASE-TX Workgroup FastModule

[Figure 1-1](#) illustrates the front panel of the 12-Port 100BASE-TX Workgroup FastModule.

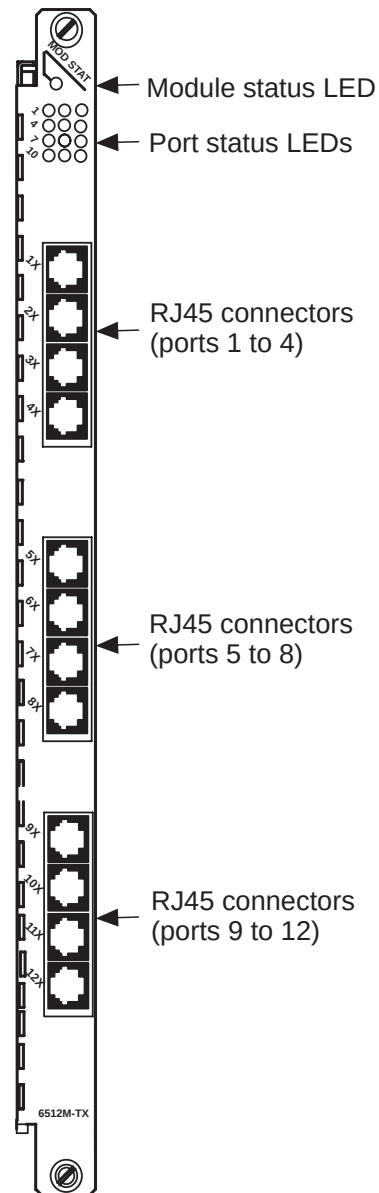


Figure 1-1 CoreBuilder 5000 12-Port 100BASE-TX Workgroup FastModule Front Panel

100BASE-TX Workgroup FastModule Features

[Table 1-1](#) lists the CoreBuilder 5000 12-Port 100BASE-TX Workgroup FastModule features.

Table 1-1 100BASE-TX Workgroup FastModule Features

Feature	Description
Workgroup Fast Ethernet	Provides high-density workgroup Ethernet FastModules for implementation of Fast Ethernet to the desktop. Workgroups help you achieve reduced traffic congestion and increased service levels on the existing network by implementing microsegmented Fast Ethernet.
Connectivity to Four Fast Ethernet Channels	Connects to each of the four Fast Ethernet channels located on the TriChannel [®] backplane of the CoreBuilder 5000 hub.
Fault Tolerance	Ensures maximum network availability with no single point of failure (redundant link).
Remote Diagnostics	Checks driver and receiver integrity using Remote Diagnostics mode. Setting a port to this mode allows the port to indicate a receive link error to the externally-connected port by not transmitting any link signals.
Repeater Statistics	Provides IEEE Repeater statistics-gathering for monitoring of CoreBuilder 5000 network management architecture. In addition, the 12-Port 10BASE-TX module supports Repeater Management Information Base (MIB) statistics through the terminal <i>without</i> the need for a Network Monitor Card.
Inventory Management	Maintains inventory information for the 12-Port 100BASE-TX module in non-volatile RAM (NVRAM). Information includes the module serial number, power requirements, power class settings (for example, power on priority), date of manufacture, and a user note pad for entering installation-specific information.
Power Management	Supports CoreBuilder 5000 power management architecture which enables the hub to intelligently enable or disable modules depending on the available power in the system.
Hot Swap Ability	You can insert or remove 100BASE-TX Workgroup FastModules without powering off the CoreBuilder 5000 chassis.
In-band and Out-of-band Management	Provides in-band SNMP and TELNET management through the 3Com CoreBuilder 5000 Distributed Management Module. Also provides out-of-band SLIP management.



To access in-band management in a hub with all 100BASE-TX Workgroup FastModules, you must have another type of FastModule, SwitchModule, or 10BASE-T Ethernet module and network monitor card installed.

Managing 100BASE-TX Workgroup FastModules

You can manage CoreBuilder 5000 100BASE-TX Workgroup FastModules using the DMM command line interface.

The DMM supports:

- In-band management using SNMP (Simple Network Management Protocol) or TELNET
- Out-of-band management using SLIP (Serial Line Interface Protocol) for TELNET and SNMP



You must use DMM software Version v4.1 or later to manage and configure the 12-Port 100BASE-TX Workgroup FastModules.

Determining Model Number

You need to determine your model number to:

- Be able to perform configurations effectively
- Identify your product for product orders or customer support
- Make certain you have the correct model number

The model number on 100BASE-TX Workgroup FastModule faceplate may differ slightly from the model number registered in the DMM or Advanced DMM software. To determine your FastModule model number for product orders or customer support:

- 1** Use the model number registered in the DMM or Advanced DMM software (to determine your software version).
- 2** Add the prefix 3C9 to the model number.

For example, use the number 3C96512M-TX for Model Number 6512M-TX.

To determine the 100BASE-TX Workgroup FastModule model number, enter the command SHOW MODULE ALL at the DMM prompt and use the model number listed in the Module field.

**100BASE-TX
Workgroup
FastModules**

[Table 1-2](#) describes the 100BASE-TX Workgroup FastModule.

Table 1-2 100BASE-TX Workgroup FastModules

Model Number	Occupies	Ports
3C96512M-TX (faceplate shows 6512M-TX)	1 slot	12 100BASE-TX ports with RJ-45 shielded connectors

2

DESIGNING YOUR NETWORK

This chapter describes how to configure networks that use the CoreBuilder™ 5000 hub and CoreBuilder 5000 12-Port 100BASE-TX Workgroup FastModules.

This chapter contains the following sections:

- [Implementing 100BASE-TX FastModules in the Network](#)
- [Using Module Workgroups](#)
- [Setting Redundant Links](#)
- [Making Network Connections](#)
- [Sample 100BASE-TX Workgroup FastModule Configuration](#)

Implementing 100BASE-TX FastModules in the Network

This section describes the following topics:

- [Software Requirements](#)
- [Network Configuration Rules](#)

This chapter describes how to use the CoreBuilder 5000 hub with the 12-Port 100BASE-TX Workgroup FastModule.

Software Requirements

You must have the 3Com® CoreBuilder 5000 Distributed Management Module (DMM) and the advanced DMM/Controller module software Version v4.1 or later to manage and configure 12-Port 100BASE-TX Workgroup FastModules.

Network Configuration Rules

This section describes general rules for configuring a Fast Ethernet network using twisted pair as the horizontal medium (connection to printers, computers). It also provides rules to ensure that your network configuration conforms to distance limitations imposed by Ethernet and networking equipment.

The following topics are discussed:

- [Before Configuring Your Network](#)
- [Basic Network Rules](#)
- [Network Backplane Restrictions](#)

Before Configuring Your Network

Before you configure your network, consider your:

- **Plans for expansion** – If the network expands beyond a certain size, you may need to add additional internetworking devices.
- **Maximum cable length** – Cabling requirements include:
 - 100 Ohm 2-pair Category 5 UTP for up to 100 meters (328 feet)
 - 100 Ohm STP for up to 100 meters (328 feet)
- **Management access** – For in-band management through the DMM, SNMP and TELNET require another type of Downlink Fastmodule, SwitchModule, or 10BASE-T Ethernet module and network monitor card installed in the hub.

Out-of-band management requires Serial Line Interface Protocol (SLIP) (includes SNMP, TELNET) and Direct Asynchronous terminals.

Basic Network Rules

This section lists basic network rules for constructing your network using Fast Ethernet:



For hardware-specific information on the 100BASE-TX Workgroup FastModule, refer to Appendix A, [Specifications](#).

- The 100BASE-TX Workgroup FastModules are a Class 1 repeater. A Class 1 repeater has an internal delay that functions as follows:
 - Only one repeater can exist between any two DTE devices within a single collision domain when you use two maximum cable length segments.
 - An *internal delay* is the time delay between the system's sensing of the first data bit received and the sensing of the first data bit transmitted on a 100 Mbps network.



Multiple 100BASE-TX Workgroup FastModules on the same network (single backplane channel) makes 1 repeater.

- The maximum UTP cable length between hub and connected workstations is 100 meters (328 feet).
- Use 2-pair Category 5 UTP or STP cable for backbone connections. Backbone cabling is the main transmission medium used to interconnect workgroups on a network.
- Use with other switching FastModules except when other switching FastModules are configured with VLANs (for detailed information on switching fast modules, refer to the *CoreBuilder 5000 FastModule User Guide*).

Network Backplane Restrictions

The CoreBuilder 5000 hub has capacity for four Fast Ethernet channels (FastChannels). When you use assign a FastModule backplane port to a CoreBuilder 5000 FastChannel, one or more backplane channels become unavailable for use.

[Table 2-1](#) lists the backplane channels that become unavailable for each Fast Ethernet Channel assignment.

Table 2-1 Fast Ethernet Channel Assignment Effect on Backplane Channels

Assigning a Backplane Port to FastChannel	Disables Ethernet Channel	Disables Token Ring Channel	Disables FDDI Channel
1	2	7, 8, and 9	4 and 5
2	1 and 2	5, 6, 10, and 11	3 and 6
3	1	1, 2, 3, and 4	1 and 2
4	3	13, 14, 15	7 and 8

Using Module Workgroups

When you set up a 12-Port 100BASE-TX FastModule as a fully-configured workgroup module, the resultant logical network configuration supports one workgroup per module. Because a managed CoreBuilder 5000 hub may contain as many as seventeen 12-Port 100BASE-TX FastModules, it is possible to configure your hub with a maximum of 17 workgroups or a maximum of 204 ports in a single workgroup.

Workgroup Definition

Workgroups are individual groups on modules set up to divide your network layout into smaller isolated networks. The CoreBuilder 5000 100BASE-TX Workgroup FastModule is a Fast Ethernet module that enables administrators to connect up to 12 network devices. You can attach workstations to the 12-Port 100BASE-TX Workgroup FastModule using RJ-45 connectors directly to the front of the module.

Workgroups:

- Provide network administrators with high flexibility in organizing their network.
- Decrease the amount of traffic on the backplane segments of the hubs in which the workgroups reside.
- By creating module workgroup networks instead of separate backplane segment networks, you can configure a maximum of 17 workgroups per hub using no backplane bandwidth.

Setting Redundant Links

When you set up a redundant link between ports on CoreBuilder 5000 hubs, the resultant configuration prevents a network failure. This section describes how to set up redundancy between:

- Two ports on one 100BASE-TX Workgroup FastModule
- Two ports on two separate 100BASE-TX Workgroup FastModule

Setting Redundancy Between Two Ports on One FastModule

To connect two links to two ports on one 12-Port 100BASE-TX FastModule:

- 1 Issue the SET PORT MODE REDUNDANT network management command.
- 2 Specify the primary link port and the backup link port.
For example, if you set up a redundant link using the following command:

```
SET PORT 8.5 MODE REDUNDANT 8.7
```

Port 5 in slot 8 becomes the primary link and port 7 in slot 8 becomes the backup link.

Setting Redundancy Between Ports on Two FastModules

To connect two links to two ports between two 12-Port 100BASE-TX FastModules:

- 1 Issue the SET PORT MODE REDUNDANT network management command.
- 2 Specify the primary link port and the backup link port.
For example, if you set up a redundant link using the following command:

```
SET PORT 12.4 MODE REDUNDANT 8.9
```

Port 4 in slot 12 becomes the primary link and port 9 in slot 8 becomes the backup link.



CAUTION: You can set redundancy between a port on the 100BASE-TX Workgroup FastModule and a port on any 10 MB module. However, you should set the 100 MB port as the primary port and the redundant or buddy port as the backup port.

After you configure redundancy:

- 1 A switchover to the backup link occurs under three conditions:
 - Link failure
 - Port partition
 - Link unstable (carrier integrity failure, port isolated)
- 2 The switchover occurs and the backup link becomes operational. The system performs a switchover back to the primary link automatically after the failure or port partition problem is resolved.



Although you can configure redundancy between two ports on a single module, you should configure redundancy between two ports on two different modules. This provides additional protection if, for example, one of the modules becomes inoperative.



If redundant front panel ports are set up from a Workgroup FastModule to a single switching FastModule, then configure the single switching FastModule using resilient link (a resilient link consists of a main link and a standby link) and set the port on the Workgroup FastModule to Remote Diagnostic mode. This sets up the remote fault tolerance feature.

Refer to the *CoreBuilder 5000 Distributed Management Module User Guide* for more information on setting redundancy between ports and refer to the *CoreBuilder 5000 FastModule User Guide* for detailed information on switching FastModules.

Making Network Connections

[Table 2-2](#) summarizes the possible schemes for connecting 100BASE-TX Workgroup FastModules in your network.

Table 2-2 Network Connections

To connect a hub to a	Use this type of connector	...And this type of cabling	Purpose
Node	RJ-45 port	Straight-through UTP	Connects PCs, servers, and other network devices directly connected to the hub.
	100BASE-TX	Straight-through UTP	
Hub	100BASE-TX Switch FastModule using RJ-45 connectors	Category 5 crossover UTP cable	Connects another hub. When you make this connection, you must connect to the front panel TX port on a 7-port 100BASE-FX/TX FastModule.

The maximum allowable distance between the hub and a PC, server, or other devices is 100 meters of Category 5 UTP cable. The UTP cable used for hub-to-node connections is a straight-through connection. No crossovers should be present.

Sample 100BASE-TX Workgroup FastModule Configuration

[Figure 2-1](#) shows a sample network configuration that implements 100BASE-TX Workgroup FastModules and CoreBuilder 5000 Switching FastModules in the CoreBuilder 5000 hub.

A typical configuration for the 100BASE-TX Workgroup FastModule is when you have a CoreBuilder 5000 7-slot hub running several 12-port 100BASE-TX Workgroup FastModules with a 100BASE-TX/FX FastModule for a Fast Ethernet downlink connection over the backplane.

The 7-port 100BASE-FX/TX FastModule provides seven switched Fast Ethernet connections to any one of four CoreBuilder 5000 FastChannel backplane networks. When used in conjunction with other CoreBuilder 5000 FastModules, this FastModule lets you create backbone and floor configurations based on shared and switched Fast Ethernet and Ethernet. The 100BASE-TX ports on the 7-port FastModule using RJ-45 connectors can be used to provide dedicated 100 Mbps connections to workgroup servers

Users are connected to each of the 12 ports on the 100BASE-TX Workgroup FastModule distributed among the four Fast Ethernet channels. These channels are aggregated and downlinked through the switching 100BASE-TX/FX FastModule in the CoreBuilder 5000 hub.

For more information on switching fast modules, refer to the *CoreBuilder 5000 FastModule User Guide*.

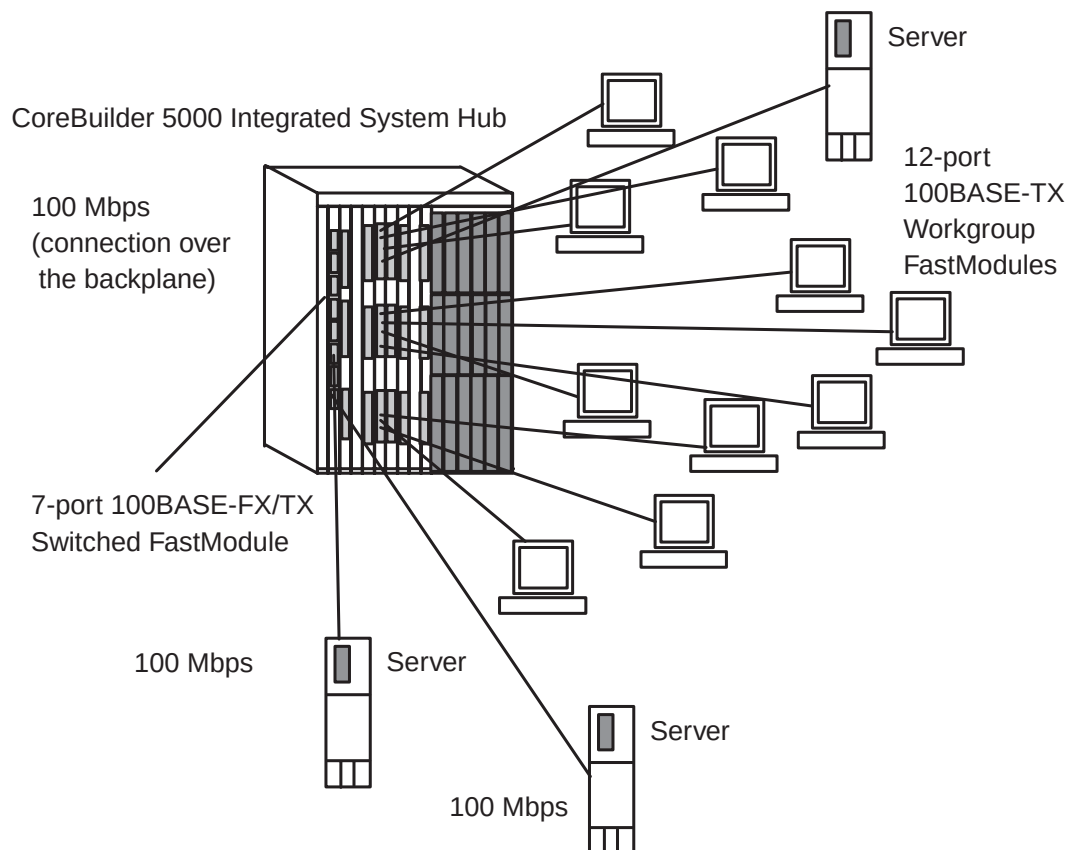


Figure 2-1 Sample 100BASE-TX Workgroup FastModule Configuration

3

INSTALLING THE MODULE

This chapter describes how to install the CoreBuilder™ 5000 12-Port 100BASE-TX Workgroup FastModule.

A quick start and reference guide for the 3Com® 12-Port 100BASE-TX Workgroup FastModule lists LED indicators, installation information, and other module information.

This chapter contains the following sections:

- [Precautionary Procedures](#)
- [Unpacking Procedures](#)
- [Quick Installation](#)
- [Setting DIP Switches](#)
- [Installing the Module](#)



Read the precautionary procedures before unpacking the module.

Precautionary Procedures



CAUTION: Electrostatic discharge (ESD) can damage static-sensitive devices on circuit boards.

Follow these precautions when you handle the 12-Port 100BASE-TX Workgroup FastModule:

- Do not remove the board from its antistatic shielding bag until you are ready to inspect or install it.
- Handle the board by the faceplate only.

Use one of the following proper grounding techniques when you install the 12-Port 100BASE-TX Workgroup FastModule:

- Use a foot strap and grounded mat or wear a grounded static discharge wrist strap.
- Touch the grounded rack or other source of ground just before you handle the module and I/O cards.



CAUTION: *Although the LEDs used in this product meet the regulatory requirements for casual exposure to the eye, as with any source of bright light, it is advised that one does not look into the light source.*

Unpacking Procedures

To unpack the 12-Port 100BASE-TX Workgroup FastModule:

- 1 Verify that the 12-Port 100BASE-TX Workgroup FastModule (Model Number 6512M-TX) is the model you ordered by checking the model number listed on the side of the shipping carton.
- 2 Note that the product model number printed on the shipping box differs from the model number on the product. The model number on the shipping box contains the prefix '3C9'.
- 3 Remove the 12-Port 100BASE-TX Workgroup FastModule, in its antistatic bag, from the shipping carton.
- 4 Remove the module from the antistatic shielding bag and inspect it for damage.

Always handle the 12-Port 100BASE-TX Workgroup FastModule by the faceplate, being careful not to touch the components. If the module appears to be damaged, return it to the antistatic shielding bag, repack it in the shipping carton, and contact your local supplier.

Keep the shipping carton and antistatic shielding bag in which your module was shipped for future storage or shipment.

- 5 Record the serial number of your 12-Port 100BASE-TX Workgroup FastModule. The Hub Planning Chart, located in the CoreBuilder 5000 reference binder, and the Module Planning Chart supplied with your module are provided for this purpose.

Quick Installation

[Table 3-1](#) outlines the steps for the installation of your module. If you are familiar with installing CoreBuilder 5000 modules, use this table as a checklist. Otherwise, consult the remainder of this chapter.

Table 3-1 Quick Installation Checklist

Step	Procedure	Chapter/Section
1	Verify that your network complies with the basic rules for network design.	Chapter 2, Designing Your Network
2	Unpack the module.	Chapter 3, Unpacking Procedures
3	Configure the DIP switch settings. If you have a network management module installed in the hub, configure the module using the management commands described later in this chapter.	Chapter 3, Setting DIP Switches
4	Enter the SHOW POWER ¹ command at the command line of the terminal. This command displays current power requirements for the hub.	Chapter 3, Installing the Module
5	Insert a 12-Port 100BASE-TX Workgroup Fastmodule into one open slot in the hub. Fasten the ejectors and tighten the faceplate screws.	Chapter 3, Installing the Module
6	Establish connections from the 12-port 100BASE-TX Workgroup Fastmodule to devices using the appropriate connectors and cabling.	Chapter 3, Installing the Module
7	Verify LED status for normal operation.	Chapter 4, Verifying LED and Network Operation
¹ Refer to the <i>CoreBuilder 5000 Integrated System Hub Installation and Operation Guide</i> for details on hub power requirements.		



For information about potential problems, consult the troubleshooting techniques in [Chapter 5](#).

Setting DIP Switches

If you are using a management module and do not plan to use the DIP configuration command, skip this section and go to the section [Installing the Module](#) in this chapter.

The CoreBuilder 5000 Ethernet 12-Port 100BASE-TX Workgroup FastModule has an 8-position DIP switch. All of the DIP switch settings on the 12-Port 100BASE-TX Workgroup FastModule are ignored if an appropriate CoreBuilder 5000 network management module (for example, DMM Version v4.10 or later) is already installed in the hub. Use network management commands, rather than the DIP switches, to configure the module.

This section describes:

- [DIP Switch Features](#)
- [Setting the DIP Switches](#)
- [DIP Switch Definition](#)

DIP Switch Features

Use the DIP switch to:

- Select a network for all ports on the 12-port 100BASE-TX Workgroup FastModule
- Choose the primary module configuration:
 - Non-volatile RAM configuration (software configuration)
 - DIP segment selection (DIP-specified module configuration)

Setting the DIP Switches

To set the module to access the DIP switch settings when using a management module, issue the SET DEVICE DIP_CONFIGURATION command from the management module.



If you do not have a CoreBuilder 5000 Distributed Management Module installed in your hub, your hub configuration defaults to the DIP switch settings on the module.

Figure 3-1 shows the DIP switch location on the module.

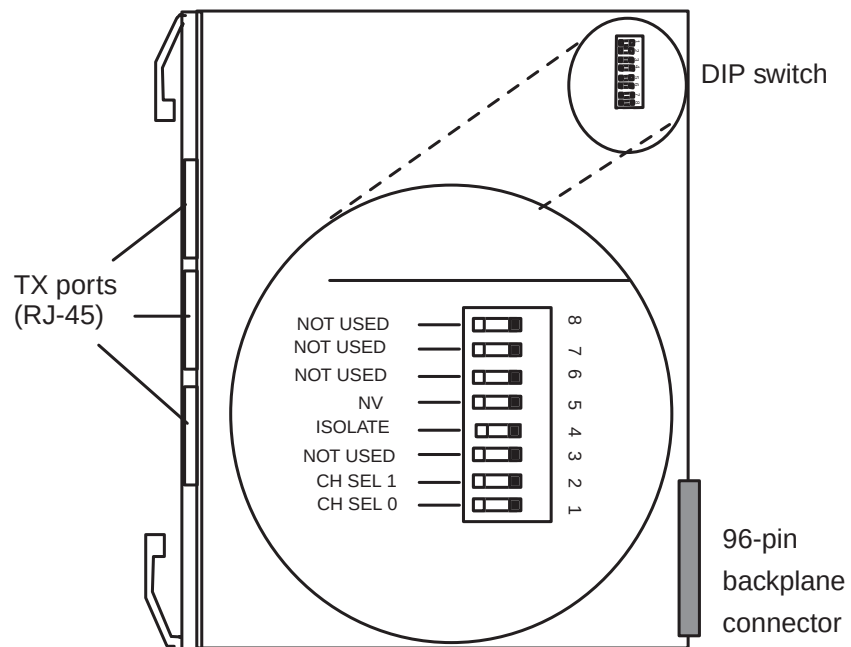


Figure 3-1 12-Port 100BASE-TX Workgroup FastModule DIP Switch Location

DIP Switch Definition

The DIP switch settings on the module refer to the backplane connection as the channel selection (CH SEL). The channel setting and the network setting are the same.

Use the DIP switch settings on the 12-Port 100BASE-TX Workgroup FastModule to assign the module to network one through four or to the isolated segment.

Table 3-2 describes the following DIP switch settings:

- **Switches 1 and 2** – Enable you to configure all ports to one of the Fast Ethernet backplane segments (Fast Ethernet 1 to Fast Ethernet 4).
- **Switch 3** – No operation.
- **Switch 4** – Enables you to configure all ports to one Isolate segment.

- **Switch 5** – Enables you to switch between non-volatile RAM (NVRAM) or DIP-switch controlled configuration.
- **Switches 6, 7, and 8** – Not used.

Table 3-2 Network Selection DIP Switch Settings

Network Selection	Switch Settings ¹		
	Switch 4	Switch 2	Switch 1
1 (default)	Off	Off	Off
2	Off	Off	On
3	Off	On	Off
4	Off	On	On
Isolated	On	N/A	N/A

¹By default, Switch 5 is set to NVRAM. When enabled, settings stored in NVRAM take precedence over DIP Switch settings 1 through 3.



The DIP switch legend ([Figure 3-1](#)) on the module refers to the backplane connection as the channel selection (CH SEL). The channel setting and the network setting are the same. Ports set to the same network communicate with each other. If the switch labeled ISOLATE is On, it sets the module to Isolated.

Default DIP Switch Settings

When the 12-Port 100BASE-TX Workgroup FastModule is first installed, the hub checks for DIP switch configuration settings in the DMM and decides the following:

- If the hub is managed, the module uses the DIP switch settings from the DMM.
- If the hub is unmanaged, then the 12-Port 100BASE-TX Workgroup FastModule:
 - a Checks for configuration settings stored in NVRAM.
 - b Checks the DIP switches for configuration information if there are no configuration settings in NVRAM or DIP Switch is set to DIP-switch controlled configuration.

Installing the Module

You do not need to power off the CoreBuilder 5000 hub to install or remove the 12-Port 100BASE-TX Workgroup FastModule. You can insert the module while the hub is operating (this is called a hot swap).

To install a 12-Port 100BASE-TX Workgroup FastModule into the hub:

- 1** Use one of the following proper grounding techniques when you install the 12-Port 100BASE-TX Workgroup FastModule:
 - a** Properly ground yourself prior to handling the 12-Port 100BASE-TX Workgroup FastModule.
 - b** Attach a static wrist guard to yourself or touch a grounded static mat prior to handling the 12-Port 100BASE-TX Workgroup FastModule.
- 2** Configure the 12-Port 100BASE-TX Workgroup FastModule:
 - a** If you plan to install the 12-Port 100BASE-TX Workgroup FastModule in a managed hub (for example, DMM Version v4.10), go to step 3 to complete the installation. To configure the appropriate settings, refer to the section [Configuring the Module](#) later in Chapter 4.
 - b** If you plan to insert the 12-Port 100BASE-TX Workgroup FastModule in an unmanaged hub, configure the DIP switch settings on the module to the desired settings (refer to the section [Setting DIP Switches](#) earlier in this chapter) and go to step 4.
- 3** To determine if the hub has enough power for the new module, from the DMM command line, enter the SHOW POWER BUDGET command. Refer to Appendix A, [Specifications](#), for details on power requirements for each of the specified watts ranges.

Refer to the *CoreBuilder 5000 Distributed Management Module Commands Guide* for information on the SHOW POWER BUDGET command.
- 4** Locate an open slot in the hub. Remove the appropriate number of blank panels on the hub to expose a slot for the module, if necessary.

[Figure 3-2](#) shows the installation of a CoreBuilder 5000 module (The module in the diagram is only a representation of a CoreBuilder 5000 module, not the 100BASE-TX module).

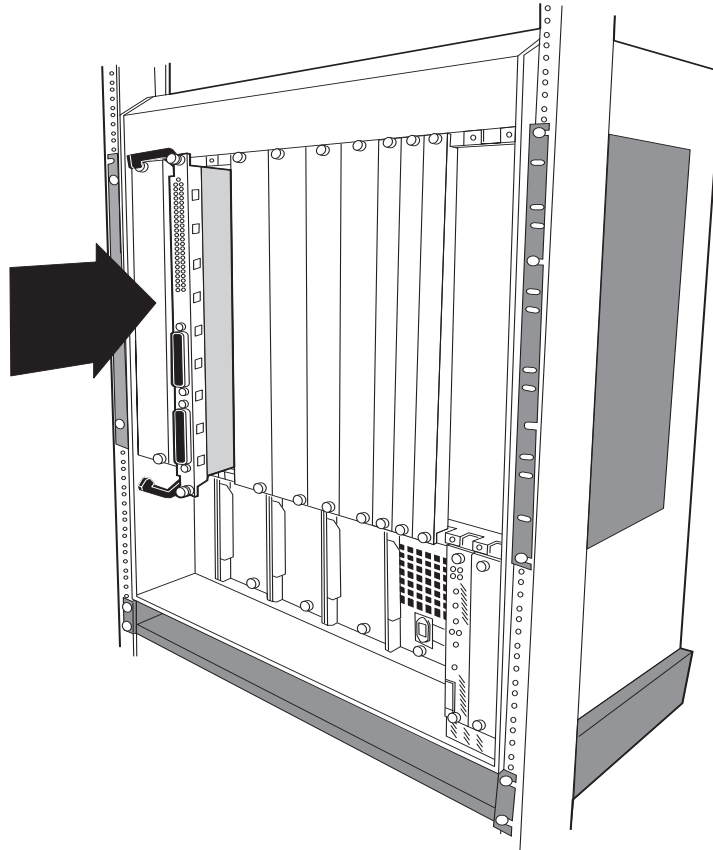


Figure 3-2 Installing a CoreBuilder 5000 Module

- 5 Insert the module into the board guides at the top and bottom of the slot and slide it into the hub by pressing firmly at the top and bottom of the faceplate.

- 6 Close the 12-Port 100BASE-TX Workgroup FastModule ejectors ([Figure 3-3](#)).

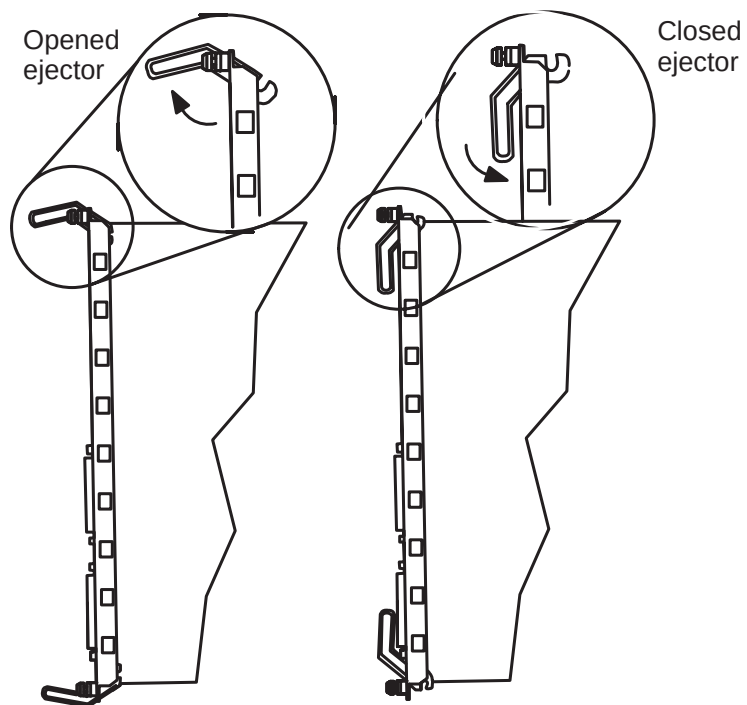


Figure 3-3 Opened and Closed Module Ejectors

- 7 Using your fingers, fasten the spring-loaded screws on the front of the 12-Port 100BASE-TX Workgroup FastModule faceplate to the hub (do not overtighten).
- 8 Attach the RJ-45 cable connectors to the RJ-45 connectors on the front of the module.

4

CONFIGURING THE MODULE

This chapter describes how to configure the 3Com CoreBuilder™ 5000 12-Port 100BASE-TX Workgroup FastModule.

A quick start and reference guide for the 12-Port 100BASE-TX Workgroup FastModule lists the LED indicators and other module information.

This chapter contains the following sections:

- [Configuring the Module](#)
- [Showing Module Configurations](#)
- [Gathering Repeater Statistics](#)
- [Monitoring the Front Panel](#)
- [Verifying LED and Network Operation](#)

Configuring the Module

This section describes how to configure the module using network management commands. The following network management commands are used to configure the 12-Port 100BASE-TX Workgroup FastModule:

- Set port mode commands
- Set port alert filter command
- Select the Fast Ethernet network on the module

For additional information on network management commands, refer to the *CoreBuilder 5000 Distributed Management Module Commands Guide*.

Configuration Overview

The CoreBuilder 5000 Distributed Management Module (DMM) and the Advanced DMM/Controller Module provide network management for the CoreBuilder 5000 hub and its modules. Use network management commands, rather than the DIP switches, to configure the module. All of the DIP switch settings on the 12-Port 100BASE-TX Workgroup FastModule are ignored if an appropriate CoreBuilder 5000 Distributed Management Module (DMM Version v4.10 or later) is already installed in the hub.

If network management is present when you first install the module, the:

- Network defaults to isolated mode.
- Ports are automatically disabled (so that users cannot join the network undetected by network management).

Therefore, you must enable the ports you want to use and set the module ports to the appropriate network using management commands.



Do not manage (get statistics or configure) this module from a slave management module.

Set Port Mode Commands

To enable ports and set the module ports to the appropriate network, use the following SET PORT MODE commands:

- [Enable/Disable/Shutdown Ports Command](#)
- [Setting Port Redundancy Command](#)
- [Setting Remote Diagnostics Command](#)
- [Set Port Alert Filter Command](#)
- [Network Selection](#)

Enable/Disable/Shutdown Ports Command

This command allows you to enable, disable, and shutdown each port on the 12-Port 100BASE-TX Workgroup FastModule.

When a port is set to:

- **Enable** – It transmits to and receives data from the network to which the port is assigned.
- **Disable** – It does not transmit or receive data. (Link integrity is unaffected).
- **Shutdown** – It is disabled, turns off link integrity, and does not transmit or receive data. The port responds with status OFF at the terminal.

Use the following command to enable, disable, or shutdown a port:

```
SET PORT    {slot.port} MODE {disable}  
            {slot.all}      {enable}  
                                {shutdown}
```

Setting Port Redundancy Command

This command allows you to set redundancy between ports. When you set two ports redundant to each other, the secondary port takes over if the primary port fails.



To support 100BASE-TX Fast Ethernet features, you may use either another 100 MB port or another 10BASE-T port as the backup.

Use the following command to set redundancy between ports:

```
SET PORT    {slot.port} MODE {redundant}  
            {slot.port}      {non-redundant}
```

For an example of port redundancy, refer to the section Setting Redundant Links in Chapter 2.

Setting Remote Diagnostics Command

This command allows the 12-Port 100BASE-TX Workgroup FastModule to detect certain unusual failure conditions. This mode completes the fault-tolerance of a redundant link.

Use the following command to set remote diagnostics:

```
SET PORT {slot.port} MODE {REMOTE_DIAGNOSTICS}
        {slot.port}      {NON_REMOTE_DIAGNOSTICS}
```



In the command above, the last variable, slot.port, is optional. If entered, both ports are placed into remote diagnostic mode and referred to as buddy ports to each other. If you turn one port off (place in non-remote diagnostic mode) then the other port is also turned off.

Set Port Alert Filter Command

This command allows you to override the Port Alert Filter feature on a port-by-port basis. The Port Alert Filter feature enables or disables the DMM delivery of port up and port down traps. You can use this command to continue to monitor port status on crucial ports (file servers, for example), while alerts from other ports are disabled.

Configure Alert Filter to:

- **Enable** – To use the Port Alert filtering feature.
- **Disable** – To allow all port up and port down alerts to display.

Use the following command to enable or disable the port up and port down alerts for a port:

```
SET PORT {slot.port} ALERT_FILTER {disable}
        {slot.all}                {enable}
```

The following output is an example of the SET PORT ALERT_FILTER command issued for port 1 of a 12-port module in slot 1:

```
CB5000> set port 1.1 alert_filter disable
Port 01.01 Alert Filter set to DISABLE
```



Perform the SET ALERT PORT_UP_DOWN FILTER command on the DMM before you use the SET PORT ALERT_FILTER command on the module.

For more information on this command, refer to the *CoreBuilder 5000 Distributed Management Module Commands Guide*.

Network Selection

This command provides module-level configuration flexibility using the unique architecture of the CoreBuilder 5000 hub. You can assign the module to:

- Any of four Fast Ethernet backplane segments
- An Isolated segment

Use the DIP switch settings on the 12-Port 100BASE-TX Workgroup FastModule to assign the module to network one through four or to the isolated segment. Network management, also lets you assign the module to a network.

Use the following command to assign the module to a network:

```
SET MODULE {slot.1} NETWORK    {fast_ether_1..._4}  
                                {isolated}
```

This command also assigns users to a backplane segment or the isolated segment.



The 100BASE-TX Workgroup FastModule cannot be connected to a Fast Ethernet channel that has a Virtual LAN trunk (VLT) configured from a switching FastModule. An error condition occurs. The following error message displays:

```
Virtual LAN Trunk Module has been Enabled for this  
Network by other module(s) configured to this Network;  
command aborted
```



For example, do not configure a switched FastModule with VLT mode disabled to a network (Fast Ethernet 1) which is already configured with VLT mode enabled.

Showing Module Configurations

You can display status information about the 12-Port 100BASE-TX Workgroup FastModule using the following network management commands:

- SHOW MODULE
- SHOW PORT

Show Module Command

This command enables users to display both brief and verbose information about a particular module.

Use the following command to display module information:

```
SHOW MODULE{slot.1}          {verbose}
                              {no_verbose}
```

The following output is an example of the SHOW MODULE VERBOSE command issued for a 12-Port 100BASE-TX Workgroup FastModule installed in slot 10:

```
CB5000> show module 10.1 verbose
```

```
Slot  Module Version Network General Information
-----
```

```
10.01 6512M-TX'v1.00 FAST_ETHER_1 Port(s) are down
```

```
6512M-TX: FastModule 100BASE-TX 12Port Shared Fast Ethernet
```

```
Boot Version:                v1.00
Network DIP Setting:         FAST_ETHER_1
Non-Volatile DIP Setting:    DISABLED
```

Show Port Command

This command enables users to display brief and verbose information on both individual ports and all ports collectively.

Use the following command to display port information:

```
SHOW PORT {slot.port} {verbose}
          {slot.all}  {no_verbose}
```

The following output is an example of the SHOW PORT VERBOSE command issued for port 2 on a 12-Port 100BASE-TX Workgroup FastModule installed in slot 10:

```
CB5000> show port 10.2 verbose
```

Port Display for Module 6512M-TX:

Port	Mode	Status	Network	General Information
10.02	ENABLED	OKAY	FAST_ETHER_1	
Alert Filter:			DISABLED	
Port Connector:			RJ-45	

Gathering Repeater Statistics

This section describes how the 12-Port 100BASE-TX Workgroup FastModule:

- Gathers repeater statistics
- Monitors network statistics

Statistics-Gathering Process

The 12-Port 100BASE-TX Workgroup FastModule gathers repeater statistics for each port (for example, collision, partition, late events, data rate mismatch, and short event statistics). This module gathers repeater statistics without the use of a network monitor card.



Repeater statistics are gathered from traffic only entering through the front panel ports on the 100BASE-TX Workgroup FastModule. The only statistics counted are those received on the front panel ports.

The repeater statistics that are available include:

- **Network** – Network statistics are presented by gathering events from all ports on the 12-Port 100BASE-TX Workgroup FastModules specified on the network. Network statistics are the total amount of all of the module statistics together.
- **Module** – Module statistics represent the total events from traffic entering on all ports on a specified module.
- **Port** – Per-port statistics are a count of events from traffic entering the specified port.

Monitor Command

This Monitor command:

- Allows you to monitor each network (individually) by specifying the backplane or isolated segment to which the module is configured.
- Supports repeater statistics at the module (group) and port levels.



You cannot enter DMM commands while in Monitor mode.

Use the following command to monitor repeater statistics:

```
MONITOR {mm:ss} {REPEATER} {fast_ethernet_1..._4, isolated}
                                     {module}    {slot}
                                     {port}      {slot.port}
```

The system-specified range of time for the polling interval is 00 to 30 minutes (mm) and 05 to 59 seconds (ss). Use these ranges when specifying a length of time between monitor display updates.

You must set a *polling interval* for the Monitor command. The polling interval defines the time between monitor display updates. The monitor displays the statistics for the last polling interval and a cumulative count (initialized to all zeros at the start of the monitor display). The Monitor command normalizes the repeater statistics from the values when invoked and when ever a counter rolls over or reaches maximum count.

The following output is an example of the MONITOR REPEATER command for a 12-Port 100BASE-TX Workgroup FastModule assigned to network Fast_Ethernet_1.

This example monitors Fast_Ethernet_1 every 10 seconds:

```
CB5000> monitor 00:10 repeater fast_ether_1
```

```
Repeater Statistics for FAST_ETHER_1
```

```
-----
Cumulative      Last Time Interval
-----
Transmit Collisions      0      0
Readable Frames      51857      28255
Readable Octets      53308996      29046140
Upper 32 Readable Octets 142      1
Runts      0      0
FCS Errors      0      0
Late Events      0      0
Short Events      0      0
Frame Too Long      0      0
Very Long Events      0      0
Alignment Errors      0      0
Collisions      0      0
Data Rate Mismatches      0      0
Auto Partition Count      0      0
Isolates      0      0
Symbol Errors      0      0
Last Source Address      N/A      08-01-20-21-3d-52
Display will refresh every 10 seconds.
Press CTRL-C to exit.
```



In the previous example, the Upper 32 Readable Octets display 140. (The actual count of octets is $142 \times (\text{times}) 2^{32}$.)

100BASE-TX Workgroup FastModule Version v1.10 and DMM Version v5.0 support three new 100MB repeater statistics (Upper 32 Readable Octets, number of Isolates, and Symbol Errors) using the SHOW COUNTER command and the MONITOR command. 100BASE-TX Workgroup FastModule Version v1.10 works with DMM Version v4.10. However, DMM Version v5.0 is required to display the three new repeater statistic entries.

If you are using DMM Version v5.0, you must use 100BASE-TX Workgroup FastModule Version v1.10 to properly display any statistics.

Transmit collisions only display on a network level (not port or module level). Transmit collisions statistics are not supported by this module.

Status on the module has a periodic rate of gathering statistics and updating approximately every second.

Table 4-1 describes repeater statistics.

Table 4-1 Repeater Statistics Description

Field	Description
Readable Frames	Readable (uncorrupted) frames received at repeater.
Readable Octets	Readable (uncorrupted) octets received at repeater (the lower 32 bits of a 64-bit readable octets counter).
Upper 32 Readable Octets	The upper readable (uncorrupted) octets (2^{32}) received at repeater. It contains the upper 32 bits of a 64-bit readable octets counter.
Runts	Packets less than 64 bytes.
FCS Errors	Frame Check Sequence errors.
Late Events	Collision detected after 512 bits were received from a port.
Short Events	Packets less than 80 bit times received.
Frame Too Longs	Frames in excess of 1518 bytes received.
Very Long Events	Port entered a jabber lockup state due to a timeout.
Alignment Errors	Number of CRC errors that do not end on a byte boundary.
Collisions	Total number of collisions detected.
Data Rate Mismatches	Number of FIFO overflow and underflow occurrences.
Autopartition Count	Number of times autopartition threshold has been passed.
Isolates	The number of automatic repeater port isolates as a consequence of false carrier events.
Symbol Errors	Number of packets containing symbol errors.
Last Source Address (port)	The source address of the last packet received by this port.

Gathering Repeater Statistics Through SNMP

In addition to using DMM commands to gather information about network traffic, you can submit SNMP (Simple Network Management Protocol) requests for MIB objects that provide specific network management information (displays repeater port statistics defined in the MIB RFC 2108).



You can also submit SNMP requests through 3Com network management applications such as Transcend LANsentry. (Transcend uses SNMP to retrieve statistics, monitor the networks, and manage modules and hubs.)

An SNMP agent resides on the Advanced/DMM Controller Module, so anyone that has access to a community (set up on the Advanced/DMM agent) can use SNMP commands to read and set MIB variables (Transcend is not required).

The following is an example of a SNMP GET command of the ReadableOctets and Upper32Octets counters from port 1 of a 100 MB Repeater (100BASE-TX Workgroup FastModule) module occupying slot 4 and set to fast_ethernet_1. This example uses the public community. To use SNMP, you must have access to the community and use the community name extension to indicate the network from which to gather statistics from.



The community table is managed on the Advanced/DMM Controller Module.

```
CB5000> getone 151.104.2.41 public@fast_ethernet_1
rptrMonitorPortReadableOctets.4.1
```

```
Repeater Statistics for FAST_ETHER_1
```

```
-----
Name:      rptrMonitorPortReadableOctets.4.1
Value:     374233968
```

```
CB5000> getone 151.104.2.41 public@fast_ethernet_1
rptrMonitorPortUpper32Octets.4.1
```

```
Repeater Statistics for FAST_ETHER_1
```

```
-----
Name:      rptrMonitorPortUpper32Octets.4.1
Value:     3
```

Show Counter Command

This command provides you with detailed information on repeater statistics at the time you enter the command.

Use the following command to view *repeater* statistics:

```
SHOW COUNTER REPEATER    {fast_ethernet_1..._4}  
                          {isolated}
```

Use the following command to view statistics on an isolated network:

```
SHOW COUNTER  REPEATER {isolated} {module}
```

Use the following command to show network, module, and port-level repeater statistics:

```
SHOW COUNTER  REPEATER {fast_ethernet_1..._4, isolated} {module} {slot}  
                                                             {port} {slot.port}
```



Both the MONITOR and SHOW COUNTER commands provide information for ongoing network statistics. The MONITOR command displays network statistics periodically at the time interval you specify in the command. The SHOW COUNTER command displays repeater statistics, at one time, since the last CLEAR COUNTER command.

The following output is an example of the SHOW COUNTER command listing REPEATER statistics:

```
CB5000> show counter repeater fast_ethernet_1 module 3
```

```
Repeater Statistics for Module 3 on FAST_ETHER_1
```

```
-----  
Readable Frames          0  
Readable Octets         689000  
Upper 32 Readable Octets 142  
Runts                   0  
FCS Errors              0  
Late Events             0  
Short Events            0  
Frames too Long         0  
Very Long Events        0  
Alignment Errors        0  
Collisions              0  
Data Rate Mismatches    0  
Auto Partition Count    0  
Isolates                0  
Symbol Errors           0  
Transmit Collisions     (display at the module level only)
```



Choose the CLEAR COUNTERS command to reset all the statistic counters to zero. If the maximum limit of a counter is reached, the counter rolls over. Each error type is followed by the number of packets received containing that error.



Clear counter starts at the time you issued the Clear Counter command.

For more information on repeater statistics, refer to the *CoreBuilder 5000 Distributed Management Module User Guide*.

Monitoring the Front Panel

Use the LEDs on the front panel of the 12-Port 100BASE-TX Workgroup FastModule to monitor the status of each port. The 12-Port 100BASE-TX Workgroup FastModule has one Module Status LED and 12 bicolor port activity and status LEDs.

Module Status LED

A single LED located at the top of the faceplate indicates the status of the module (see Figure 4-1).

Port Status and Activity LEDs

The 12-Port 100BASE-TX Workgroup FastModule has one bicolor LED for each port. This LED is capable of displaying the following two colors:

- **Green** – Displays port status information
- **Yellow** – Displays port traffic information

[Figure 4-1](#) shows the location of the LEDs. Each LED indicates the state of a port as described in [Table 4-2](#).

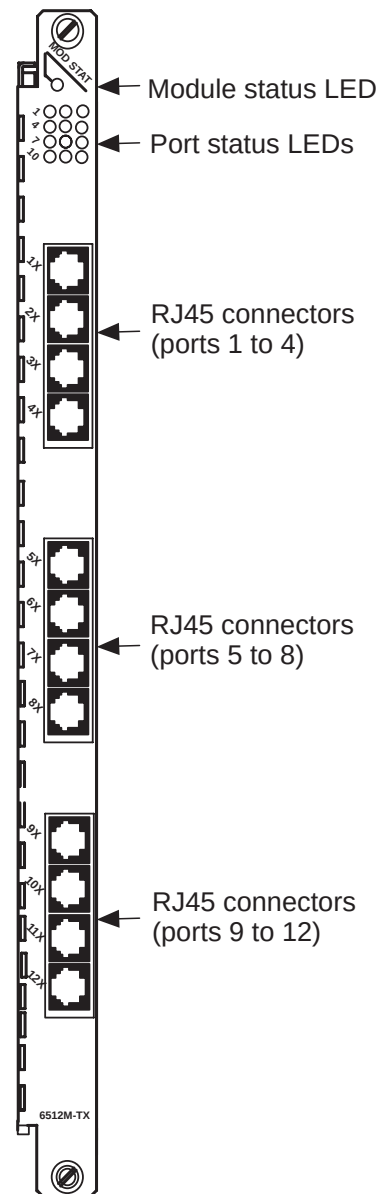


Figure 4-1 12-Port 100BASE-TX Workgroup FastModule Faceplate

[Table 4-2](#) describes the states of port LEDs.

Table 4-2 12-Port 100BASE-TX Workgroup FastModule LED Interpretations

LED Name	Color	State	Indicates
Module Status	Green	Off	No power to hub or insufficient power in the hub to support this module.
			Module download in progress.
		Blinking	Module failed self-diagnostics.
		On	Module is OK.
Port Activity/Status (Ports 1 to 12)	Green	On	Port enabled and link OK with no traffic.
			DMM initiated channel check.
		1 blink	Link failure on the port.
		2 blinks	Port partitioned because of excessive collisions.
			If a port partitions, it is automatically reconnected to the network when the problem no longer exists.
		3 blinks	Port jabber because long packets are being sent over the network.
		4 blinks	Link unstable due to carrier integrity failure.
		Off	Port or ports disabled or shutdown.
	Yellow	Off	No packets are received on the ports.
		On	Link OK. Heavy traffic activity on the port.
			Download to processor flash memory.
		Blinking	Link OK. Normal activity on the port.



There is no DMM LED to report 100BASE-TX Workgroup FastModule activity.

Verifying LED and Network Operation

To determine if your configuration is operating correctly, you must verify network operations. This section describes LED and Network verification for the 12-Port 100BASE-TX Workgroup FastModule, including:

- Using the CoreBuilder 5000 Controller Module to Verify Bicolor LED Operation
- Using the DMM to Verify Network Connections

For more information on the DMM, refer to the *CoreBuilder 5000 Distributed Management Module User Guide*.

Using the CoreBuilder 5000 Controller Module to Verify Bi-color LED Operation

The CoreBuilder 5000 hub controller module is equipped with a LED Test button on the front panel. Use this button to verify LED operation.

When you press the LED test button:

- 1 The module initiates a test to all modules in the hub. All LEDs respond by lighting continuously for approximately 5 seconds.
- 2 During this time period, the LEDs should alternate between green and yellow about every ½ second. Any LED that does not light is defective. The LED test does not disrupt network operation.



During a software download to the 12-Port 100BASE-TX Workgroup FastModule, the Module Status LED on the module is Off, and all of the other port LEDs are illuminated solid yellow until the download process is complete.

Using the DMM to Verify Network Connections

The Distributed Management Module allows you to verify each network connection (both backplane and isolated) for all CoreBuilder 5000 modules and monitor cards installed in your hub.

To initiate the verification process:

- 1 Press the Display Control Toggle button on the front of the DMM.
- 2 Observe the DMM LED matrix display sequentially cycle through each network connection including fast_ethernet_1 through 4 or Isolated.
- 3 Each status port LED associated with the network indicated on the DMM LED matrix display illuminates.

- 4 If you have an Ethernet network monitor card assigned to a 10 MB Ethernet network on a module, the Module Status LED lights to indicate the network to which it is assigned.

The following example illustrates the verification process.

**Verifying Network
Connections for the
12-port 100BASE-TX
Workgroup
FastModule**

This section describes how to verify network connections for a newly-installed 12-Port 100BASE-TX Workgroup FastModule. Assume you have a module that has its ports connected to Fast Ethernet Network FE3.

To verify this configuration:

- 1 Press the Display Control Toggle button located on the front of the DMM.
- 2 Once initiated, the DMM cycles through to the fast_ethernet network connection (in this case FE3) and performs the following:
 - a Displays the current network under examination (as shown on the DMM LCD display)
 - b Lights the port status LEDs associated with the current network
- 3 Since all ports on the module are connected only to FE3, the network verification lights all the status LEDs. Conversely, if you configured four 12-Port 100BASE-TX Workgroup FastModules with connections to all four backplane networks, the network verification process would cycle through all four networks.

5

TROUBLESHOOTING

This chapter describes troubleshooting procedures for the 3Com CoreBuilder™ 5000 12-Port 100BASE-TX Workgroup FastModule. Information on troubleshooting can assist you in verifying the module operation.

This chapter contains the following sections:

- [Troubleshooting Using the Module Status LED](#)
- [Troubleshooting Using the Port Status LEDs](#)
- [Obtaining Technical Assistance](#)

Troubleshooting Using the Module Status LED

In certain situations, the module status LED may not light. [Table 5-1](#) outlines possible causes and some solutions for troubleshooting the Module Status LED.

Table 5-1 Module Status LED Troubleshooting

LED State	Possible Cause	Corrective Action
Off	No power to hub	Check the controller module power LEDs.
	The hub does not have enough available power for a new module installation	Add another power supply to the hub. Use the SHOW POWER BUDGET management command to ascertain available power in the hub. See the <i>CoreBuilder 5000 Distributed Management Module Commands Guide</i> for details.
	The 12-port 100BASE-TX module is faulty	Try a different 12-Port 100BASE-TX module.
Blinks	Failed module diagnostics	Replace the failed module.

Troubleshooting Using the Port Status LEDs

A blinking Port Status indicator signals a problem with a port or a link connected to a port. Once a port detects a problem, you can further analyze the problem by counting the number of blinks. [Table 5-2](#) outlines possible causes and some solutions for troubleshooting the Port Status LEDs.

Table 5-2 Port Status LED Troubleshooting

LED State	Indication	Possible Cause	Corrective Action
1 blink	Link failure	Cables not connected	Connect cables.
		Cables broken	Check cables using cable tester. Repair or replace cables.
		Speed mismatch	Check network speeds.
		Connected device not powered on or it is faulty	Check on connection.
2 blinks	Port partitioned	Faulty cable	Check cable using cable tester. Repair or replace cable.
		Looped network	Check network wiring topology and remove any loops that have been created.
3 blinks	Port jabber	Faulty node connection	Reset.
4 blinks	Link unstable or isolated	Due to carrier integrity failure or an intermittent cable fault	Check connections.
Off	Ports disabled	Ports disabled	Enable ports.
		12-port 100BASE-TX Module not powered	Check the controller module Power LEDs.
		Broken LED	Press the LED test on the controller module.
		Bad 12-port 100BASE-TX module	Replace module.

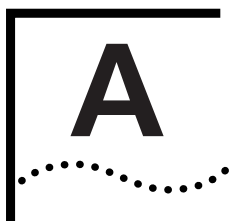
Obtaining Technical Assistance

You can receive assistance for installing and troubleshooting the 3Com CoreBuilder 5000 100BASE-TX Workgroup FastModule by calling either your 3Com reseller or 3Com Technical Support. Be prepared to supply a representative with the following information:

- Description of the problem
- Steps you have taken to try and correct the problem
- Type and software version of the CoreBuilder 5000 Distributed Management Module being used
- Version of software installed on your CoreBuilder 5000 FastModule
- Status of the front panel LEDs
- Configuration of your network
- Configuration of your concentrator



For instructions on contacting Technical Support for your product, refer to Appendix B, [Technical Support](#).



SPECIFICATIONS

This appendix lists specifications for the CoreBuilder™ 5000 12-Port 100BASE-TX Workgroup FastModules and information on cables and connectors:

- [Standard Protocol](#)
- [Cable Specifications](#)
- [Environmental Specifications](#)
- [Mechanical Specifications](#)
- [Power Specifications](#)
- [Regulatory Compliance](#)

Standard Protocol

[Table A-1](#) lists the standard protocol compliance supported by the CoreBuilder 5000 100BASE-TX Workgroup FastModule.

Table A-1 Standard Supported Protocol

Standard Protocol
IEEE 802.3u 100BASE-TX compliance

Cable Specifications

[Table A-2](#) lists the required cable type and maximum segment length.

Table A-2 Required Cable Type and Maximum Segment Length

Media	Required Cable Type	Maximum Segment Length
100BASE-TX	100 Ohm UTP Category 5	100 m (328 ft)
	100 Ohm STP	100 m (328 ft)

Environmental Specifications

[Table A-3](#) describes the required operating conditions for CoreBuilder 5000 100BASE-TX Workgroup FastModules.

Table A-3 Environmental Specifications

Specification	Value
Operating Temperature	32 to 122 °F (0 to 50 °C)
Storage Temperature	-40 to 151 °F (-40 to 66 °C)
Operating Humidity	Less than 95%, non-condensing

Mechanical Specifications

[Table A-4](#) describes the dimensions and weight of the CoreBuilder 5000 100BASE-TX Workgroup FastModules.

Table A-4 Mechanical Specifications

Model Number	Dimensions	Weight
3C96512M-TX	1.0" W x 10.275" L x 14.37" H	2.4 lb

Power Specifications

[Table A-5](#) describes the required power specifications for CoreBuilder 5000 100BASE-TX Workgroup FastModules.

Table A-5 Power Specifications

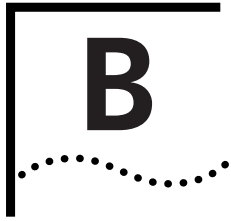
Model Number	Power Requirements at				
	+5 V	-5 V	+2 V	+12 V	-12 V
3C96512M-TX	45.0 W	3.0 W	1.0 W	2.0 W	0 W

Regulatory Compliance

[Table A-6](#) lists the regulatory certifications for all CoreBuilder 5000 hubs.

Table A-6 Regulatory Certifications

Certification	Description
Safety	UL 1950
	CSA 22.2 Number 950 (for power supplies also CSA 234 Level 3)
	TUV, VDE EN 60950
	CB Report Certificate to IEC 950
Emissions	FCC Part 15 Class A using UTP cable
	EN 55022 (CISPR 22 Class A) using UTP cable
	EN 55022 (CISPR 22 Class B) using STP cable
	VCCI Level 1 registration



TECHNICAL SUPPORT

3Com provides access to technical support information through a variety of services. This appendix describes these services.

Information contained in this appendix is correct at time of publication. For the very latest, access 3Com Corporation's World Wide Web site as described below.

This appendix describes:

- [Online Technical Services](#)
- [Support From Your Network Supplier](#)
- [Support From 3Com Corporation](#)
- [Returning Products for Repair](#)
- [Accessing the 3Com MIB](#)
- [Contacting 3Com Technical Publications](#)

Online Technical Services

3Com offers worldwide product support 24 hours a day, 7 days a week, through the following online systems:

- [World Wide Web Site](#)
- [3Com Bulletin Board Service](#)
- [3ComFacts Automated Fax Service](#)
- [3ComForum on CompuServe Online Service](#)

World Wide Web Site

Access the latest networking information on 3Com Corporation's World Wide Web site by entering our URL into your Internet browser:

`http://www.3Com.com/`

This service features news and information about 3Com products, customer service and support, 3Com Corporation's latest news releases, *NetAge* Magazine, and more.

3Com Bulletin Board Service

3ComBBS contains patches, software, and drivers for all 3Com products, as well as technical articles. This service is available through modem or ISDN 24 hours a day, 7 days a week.

Access by Analog Modem

To reach the service by modem, set your modem to 8 data bits, no parity, and 1 stop bit. Call the telephone number nearest you:

Country	Data Rate	Telephone Number
Australia	up to 14400 bps	61 2 9955 2073
Brazil	up to 14400 bps	55 11 547 9666
France	up to 14400 bps	33 1 6986 6954
Germany	up to 28800 bps	4989 62732 188
Hong Kong	up to 14400 bps	852 2537 5608
Italy (fee required)	up to 14400 bps	39 2 27300680
Japan	up to 14400 bps	81 3 3345 7266
Mexico	up to 28800 bps	52 5 520 7853
P. R. of China	up to 14400 bps	86 10 684 92351
Singapore	up to 14400 bps	65 534 5693
Taiwan	up to 14400 bps	886 2 377 5840
U.K.	up to 28800 bps	44 1442 438278
U.S.A.	up to 28800 bps	1 408 980 8204

Access by Digital Modem

ISDN users can call 3ComBBS using a digital modem for fast access up to 56 Kbps. To access 3ComBBS using ISDN, use the following number:

408 654 2703

3ComFacts Automated Fax Service

3Com Corporation's interactive fax service, 3ComFactsSM, provides data sheets, technical articles, diagrams, and troubleshooting instructions on 3Com products 24 hours a day, 7 days a week.

Call 3ComFacts using your Touch-Tone telephone using one of these international access numbers:

Country	Telephone Number
Hong Kong	852 2537 5610
U.K.	44 1442 278279
U.S.A.	1 408 727 7021

Local access numbers are available within the following countries:

Country	Telephone Number	Country	Telephone Number
Australia	1 800 123853	Netherlands	06 0228049
Belgium	0800 71279	Norway	800 11062
Denmark	800 17319	Portugal	0505 442 607
Finland	98 001 4444	Russia (Moscow only)	956 0815
France	05 90 81 58	Spain	900 964 445
Germany	0130 81 80 63	Sweden	020 792954
Italy	1678 99085	U.K.	0800 626403

3ComForum on CompuServe Online Service

3ComForum is a CompuServe-based service containing patches, software, drivers, and technical articles about 3Com products, as well as a messaging section for peer support. To use 3ComForum, you need a CompuServe® account.

To use 3ComForum:

- 1 Log on to CompuServe.
- 2 Type **go threecom**
- 3 Press Return to view the 3ComForum main menu.

Support From Your Network Supplier

If additional assistance is required, contact your network supplier. Several suppliers are authorized 3Com service partners who are qualified to provide a variety of services, including network planning, installation, hardware maintenance, application training, and support services.

If you contact your network supplier for assistance, have the following information ready:

- Diagnostic error messages
- A list of system hardware and software, including revision levels
- Details about recent configuration changes, if applicable

If you are unable to contact your network supplier, refer to the following section on how to contact 3Com.

Support From 3Com Corporation

If you are unable to receive support from your network supplier, technical support contracts are available from 3Com.

Contact your local 3Com sales office to locate your authorized service provider using one of the following numbers:

Regional Sales Office	Telephone Number	Regional Sales Office	Telephone Number
3Com Corporation U.S.A.	800 NET 3Com <i>or</i> 1 408 764 5000	3Com Ireland	353 1 820 7077
3Com ANZA East	61 2 9937 5000	3Com Japan	81 3 3345 7251
West	61 3 9866 8022	3Com Latin America	
3Com Asia Limited China	86 10 68492 568 (Beijing) 86 21 6374 0220 Ext 6115 (Shanghai)	Argentina	54 1 312 3266
Hong Kong	852 2501 1111	Brazil	55 11 546 0869
India	91 11 644 3974	Chile	56 2 633 9242
Indonesia	62 21 523 9181	Colombia	57 1 629 4110
Korea	82 2 319 4711	Mexico	52 5 520 7841
Malaysia	60 3 732 7910	Peru	51 1 221 5399
Singapore	65 538 9368	Venezuela	58 2 953 8122
Taiwan	886 2 377 5850	3Com Mediterraneo Italy	39 2 253011 (Milan) 39 6 5279941 (Rome)
Thailand	662 231 8151 4	3Com Middle East	971 4 349049
3Com Benelux B.V. Belgium	32 725 0202	3Com Nordic AB Denmark	45 39 27 85 00
Netherlands	31 30 6029700	Finland	358 0 435 420 67
3Com Canada Calgary	403 265 3266	Norway	47 22 18 40 03
Montreal	514 683 3266	Sweden	46 8 632 56 00
Ottawa	613 566 7055	3Com Russia	007 095 2580940
Toronto	416 498 3266	3Com South Africa	27 11 807 4397
Vancouver	604 434 3266	3Com UK Limited	44 131 2478558 (Edinburgh) 44 161 8737717 (Manchester) 44 1628 897000 (Marlow)
3Com France	33 1 69 86 68 00		
3Com GmbH Austria	43 1 5134323		
Czech and Slovak Republics	42 2 21845 800		
Germany	49 30 3498790 (Berlin) 49 89 627320 (Munich)		
Hungary	36 1 250 83 41		
Poland	48 22 6451351		
Switzerland	41 31 996 14 14		

Returning Products for Repair

Before you send a product directly to 3Com for repair, you must first obtain a Return Materials Authorization (RMA) number. Products sent to 3Com without RMA numbers are returned to the sender unopened, at the sender's expense.

To obtain an RMA number, call or fax:

Country	Telephone Number	Fax Number
U.S.A. and Canada	1 800 876 3266, option 2	408 764 7120
Latin America	1 408 326 7801	408 764 7120
Europe, South Africa and Middle East	44 1442 438125	44 1442 435822
Outside Europe, U.S.A., and Canada	1 408 326 7804	1 408 764 7120

Accessing the 3Com MIB

The 3Com Management Information Base (MIB) describes commands that enable you to manage 3Com SNMP-based products. The MIB is available over the Internet on an anonymous FTP server. Updates to these MIBs are released as new 3Com products are introduced.

To access Internet versions:

- 1 FTP to **ftp.3com.com** (151.104.9.65).
- 2 Enter the login name **anonymous**.
- 3 Enter your full Internet e-mail address as the password (for example, **jdoe@company.com**).
- 4 Change to the /pub/mibs directory using the command **cd/pub/mibs**.
- 5 Read the readisd.txt file to determine the MIB or MIBs you need to manage your 3Com products.
- 6 To view the 3Com MIB, OID, or schema entries, enter the **ls** command.
 - To pause the display, press Ctrl+S.
 - To continue the display, press Ctrl+Q.
- 7 Copy the MIB, OID, or schema files to your current directory using the appropriate command (for example, **get isd.mib**).
- 8 Exit the FTP session using the **quit** command.



**Contacting 3Com
Technical
Publications**

02/06/97

If you have comments or questions on 3Com Technical Publications documents, contact the Technical Publications group by fax at (508) 229-1551.

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3Com Corporation LIMITED WARRANTY

For purposes of this warranty, the **CoreBuilder 5000 100BASE-TX Workgroup FastModule** is considered an **Internetworking product**.

HARDWARE

3Com warrants its hardware products to be free from defects in workmanship and materials, under normal use and service, for the following lengths of time from the date of purchase from 3Com or its Authorized Reseller:

Internetworking products	1 year
Network adapters	Lifetime
Ethernet stackable hubs and Unmanaged Ethernet fixed port repeaters	Lifetime* (1 year if not registered)
*Power supply and fans in the stackable hubs and unmanaged repeaters	1 year
Other hardware products	1 year
Spare parts and spares kits	90 days

If a product does not operate as warranted above during the applicable warranty period, 3Com shall, at its option and expense, repair the defective product or part, deliver to Customer an equivalent product or part to replace the defective item, or refund to Customer the purchase price paid for the defective product. All products that are replaced will become the property of 3Com. Replacement products may be new or reconditioned. Any replaced or repaired product or part has a 90-day warranty or the remainder of the initial warranty period, whichever is longer.

3Com shall not be responsible for any software, firmware, information, or memory data of Customer contained in, stored on, or integrated with any products returned to 3Com for repair, whether under warranty or not.

SOFTWARE

3Com warrants that the software programs licensed from it will perform in substantial conformance to the program specifications therefor for a period of 90 days from the date of purchase from 3Com or its Authorized Reseller. 3Com warrants the media containing software against failure during the warranty period. No updates are provided. 3Com's sole obligation with respect to this express warranty shall be (at 3Com's discretion) to refund the purchase price paid by Customer for any defective software products, or to replace any defective media with software which substantially conforms to 3Com's applicable published specifications. Customer assumes responsibility for the selection of the appropriate applications program and associated reference materials. 3Com makes no warranty or representation that its software products will work in combination with any hardware or applications software products provided by third parties, that the operation of the software products will be uninterrupted or error free, or that all defects in the software products will be corrected. For any third-party products listed in the 3Com software product documentation or specifications as being compatible, 3Com will make reasonable efforts to provide compatibility, except where the noncompatibility is caused by a "bug" or defect in the third party's product.

STANDARD WARRANTY SERVICE

Standard warranty service for *hardware* products may be obtained by delivering the defective product, accompanied by a copy of the dated proof of purchase, to 3Com's Corporate Service Center or to an Authorized 3Com Service Center during the applicable warranty period. Standard warranty service for *software* products may be obtained by telephoning 3Com's Corporate Service Center or an Authorized 3Com Service Center, within the warranty period. Products returned to 3Com's Corporate Service Center must be pre-authorized by 3Com with a Return Material Authorization (RMA) number marked on the outside of the package, and sent prepaid, insured, and packaged appropriately for safe shipment. The repaired or replaced item will be shipped to Customer, at 3Com's expense, not later than 30 days after receipt of the defective product by 3Com.

WARRANTIES EXCLUSIVE

IF A 3COM PRODUCT DOES NOT OPERATE AS WARRANTED ABOVE, CUSTOMER'S SOLE REMEDY FOR BREACH OF THAT WARRANTY SHALL BE REPAIR, REPLACEMENT, OR REFUND OF THE PURCHASE PRICE PAID, AT 3COM'S OPTION. TO THE FULL EXTENT ALLOWED BY LAW, THE FOREGOING WARRANTIES AND REMEDIES ARE EXCLUSIVE AND ARE IN LIEU OF ALL OTHER WARRANTIES, TERMS, OR CONDITIONS, EXPRESS OR IMPLIED, EITHER IN FACT OR BY OPERATION OF LAW, STATUTORY OR OTHERWISE, INCLUDING WARRANTIES, TERMS, OR CONDITIONS OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND SATISFACTORY QUALITY. 3COM NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PERSON TO ASSUME FOR IT ANY OTHER LIABILITY IN CONNECTION WITH THE SALE, INSTALLATION, MAINTENANCE, OR USE OF ITS PRODUCTS.

3COM SHALL NOT BE LIABLE UNDER THIS WARRANTY IF ITS TESTING AND EXAMINATION DISCLOSE THAT THE ALLEGED DEFECT IN THE PRODUCT DOES NOT EXIST OR WAS CAUSED BY CUSTOMER'S OR ANY THIRD PERSON'S MISUSE, NEGLIGENCE, IMPROPER INSTALLATION OR TESTING, UNAUTHORIZED ATTEMPTS TO REPAIR OR MODIFY, OR ANY OTHER CAUSE BEYOND THE RANGE OF THE INTENDED USE, OR BY ACCIDENT, FIRE, LIGHTNING, OR OTHER HAZARD.

LIMITATION OF LIABILITY

TO THE FULL EXTENT ALLOWED BY LAW, 3COM ALSO EXCLUDES FOR ITSELF AND ITS SUPPLIERS ANY LIABILITY, WHETHER BASED IN CONTRACT OR TORT (INCLUDING NEGLIGENCE), FOR INCIDENTAL, CONSEQUENTIAL, INDIRECT, SPECIAL, OR PUNITIVE DAMAGES OF ANY KIND, OR FOR LOSS OF REVENUE OR PROFITS, LOSS OF BUSINESS, LOSS OF INFORMATION OR DATA, OR OTHER FINANCIAL LOSS ARISING OUT OF OR IN CONNECTION WITH THE SALE, INSTALLATION, MAINTENANCE, USE, PERFORMANCE, FAILURE, OR INTERRUPTION OF ITS PRODUCTS, EVEN IF 3COM OR ITS AUTHORIZED RESELLER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, AND LIMITS ITS LIABILITY TO REPAIR, REPLACEMENT, OR REFUND OF THE PURCHASE PRICE PAID, AT 3COM'S OPTION. THIS DISCLAIMER OF LIABILITY FOR DAMAGES WILL NOT BE AFFECTED IF ANY REMEDY PROVIDED HEREIN SHALL FAIL OF ITS ESSENTIAL PURPOSE.

Some countries, states, or provinces do not allow the exclusion or limitation of implied warranties or the limitation of incidental or consequential damages for certain products supplied to consumers, so the above limitations and exclusions may be limited in their application to you. This warranty gives you specific legal rights which may vary depending on local law.

GOVERNING LAW

This Limited Warranty shall be governed by the laws of the state of California.

3Com Corporation, 5400 Bayfront Plaza, Santa Clara, CA 95052-8145 (408) 764-5000

10/20/96